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Henniger et al.

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(54) **JUMP ROPE HANDLE AND METHOD OF ASSEMBLING SAME**

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(57) **ABSTRACT**

An improved jump rope handle and method of assembling the same. The jump rope handle includes a head. The head includes a channel, a set hole perpendicular to the channel, and a set mechanism adjustably insertable into the set hole. The jump rope handle further includes a grip. The grip includes a cylindrical member, first and second bearings arranged along the cylindrical member, an inner bushing arranged along the cylindrical member between the first and second bearings, and a sleeve around said inner bushing, said bushing being fixedly attached to an inner surface of the grip. An end portion of the cylindrical member is fixedly attached to the head whereby the cylindrical member and the head rotate together about a same axis. The channel of the head is configured to receive a rope. The set mechanism is configured to be inserted into the set hole to secure the rope.

8 Claims, 7 Drawing Sheets

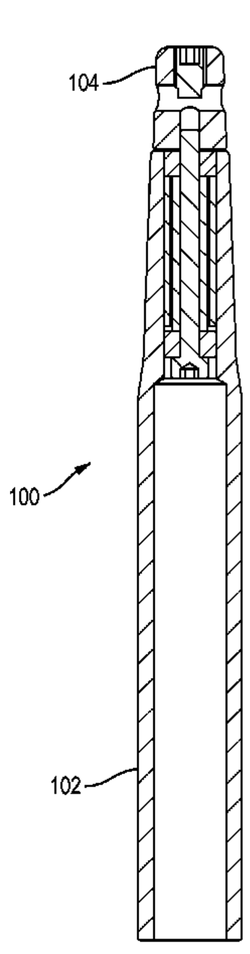

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FIG.1

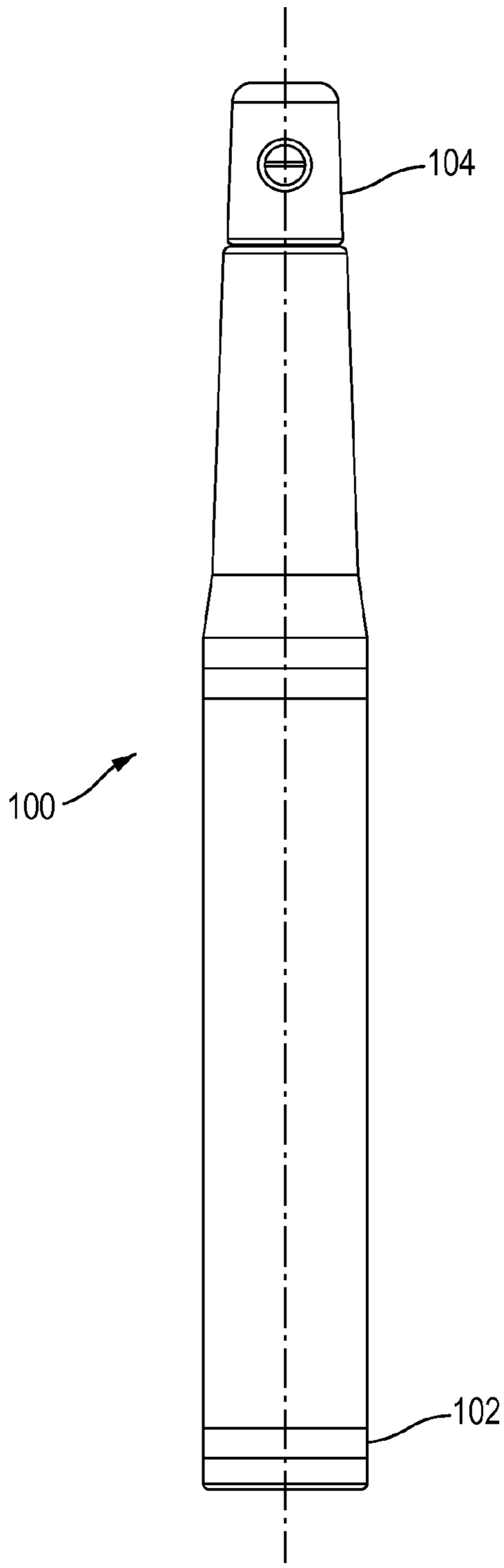
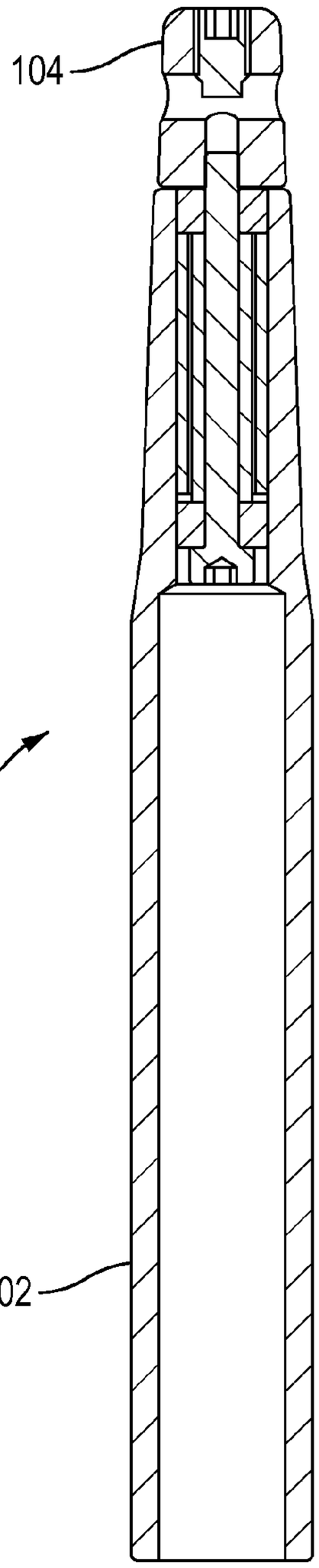


FIG.2



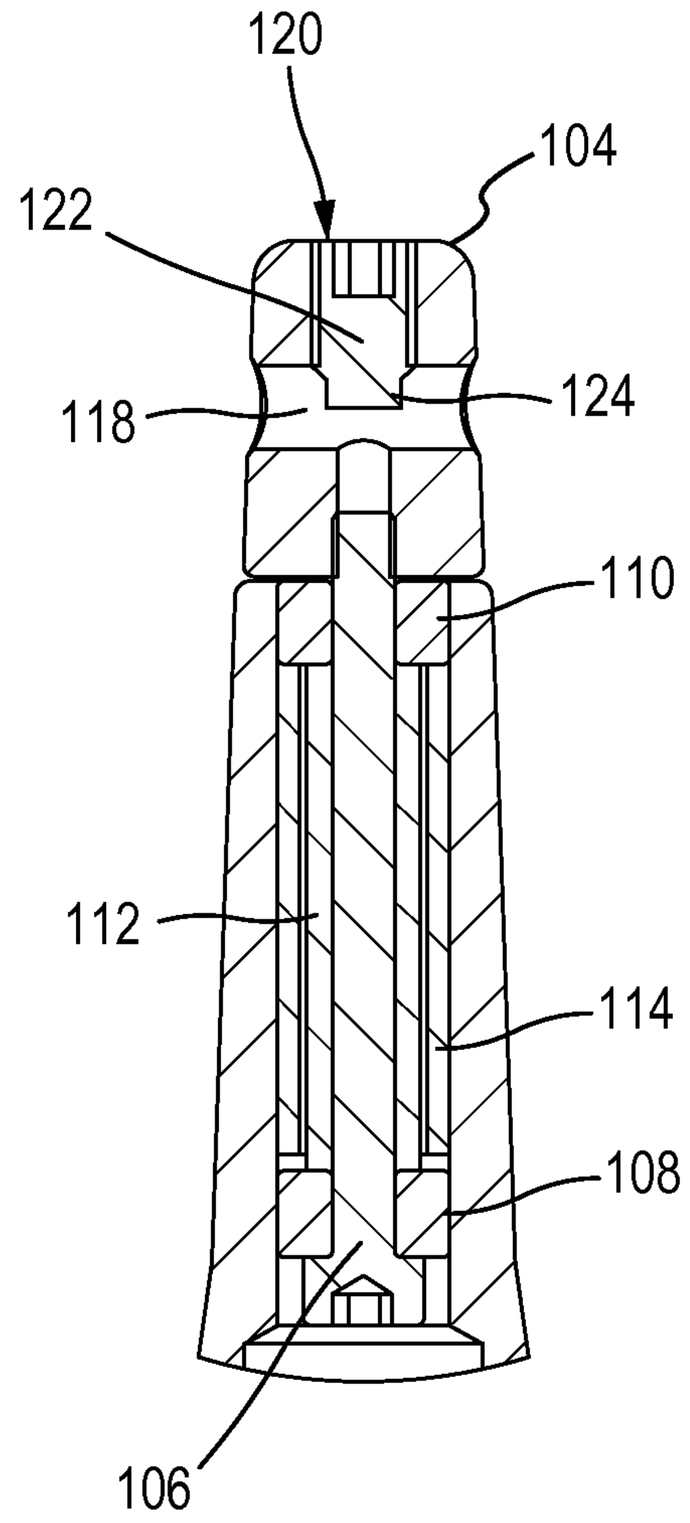


FIG.3

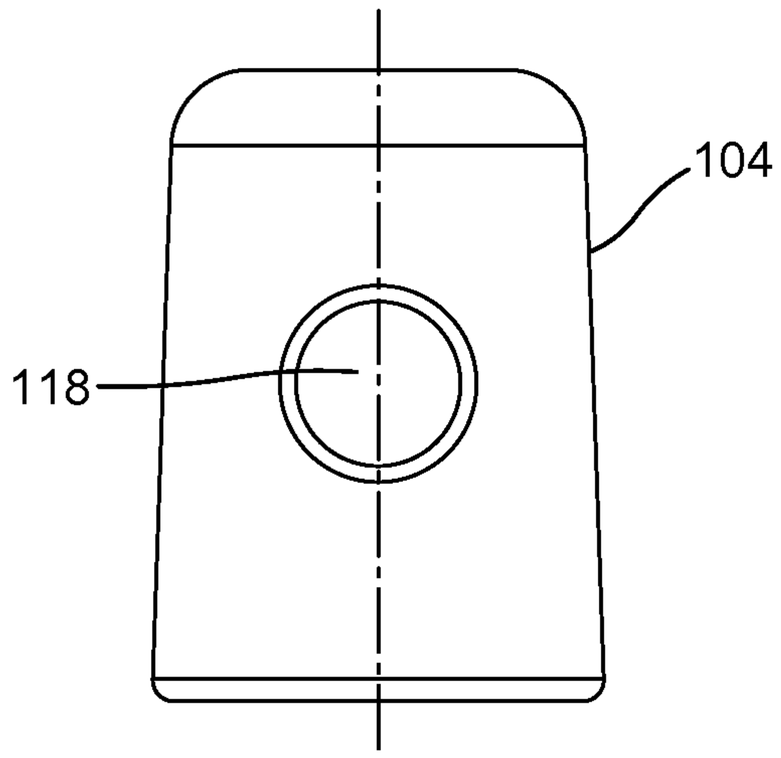


FIG.4

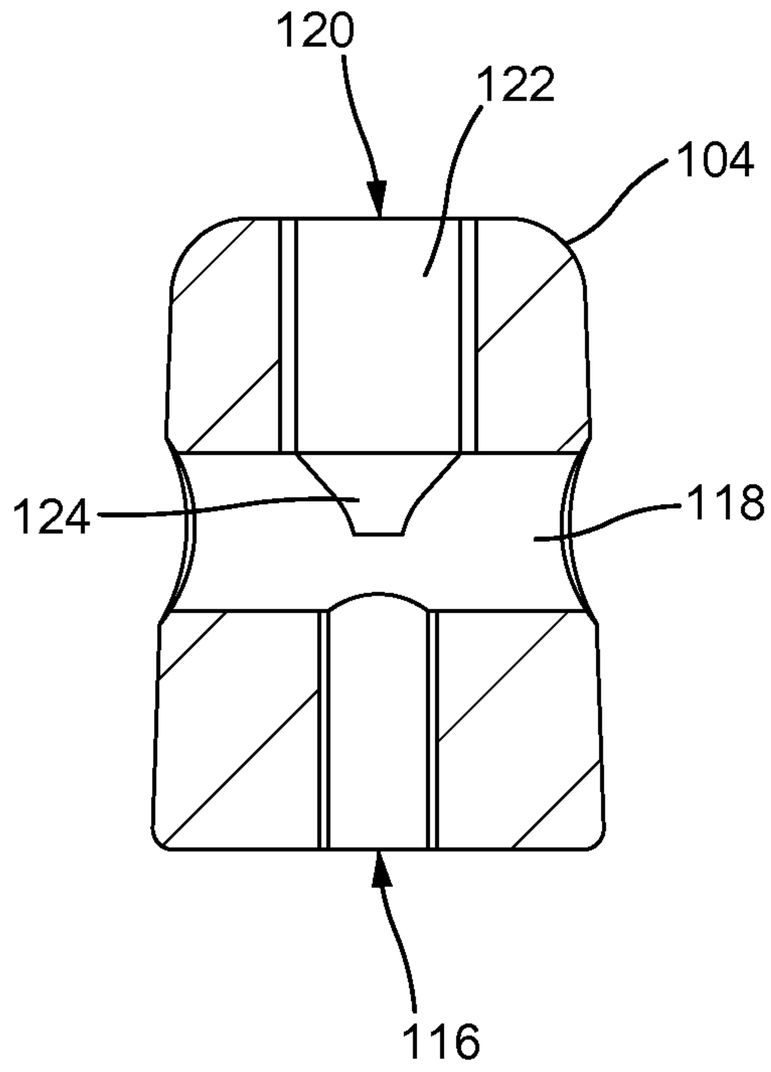


FIG.5

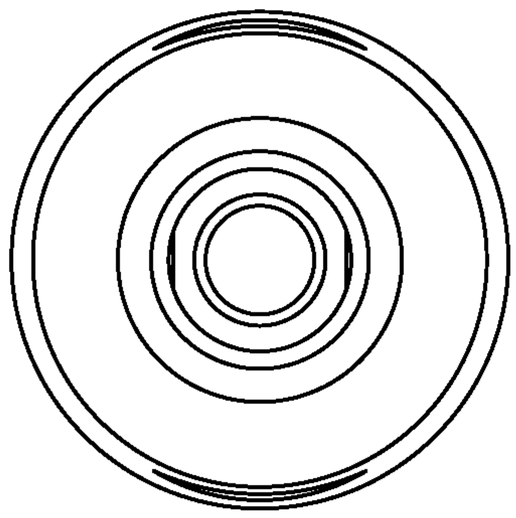


FIG.6

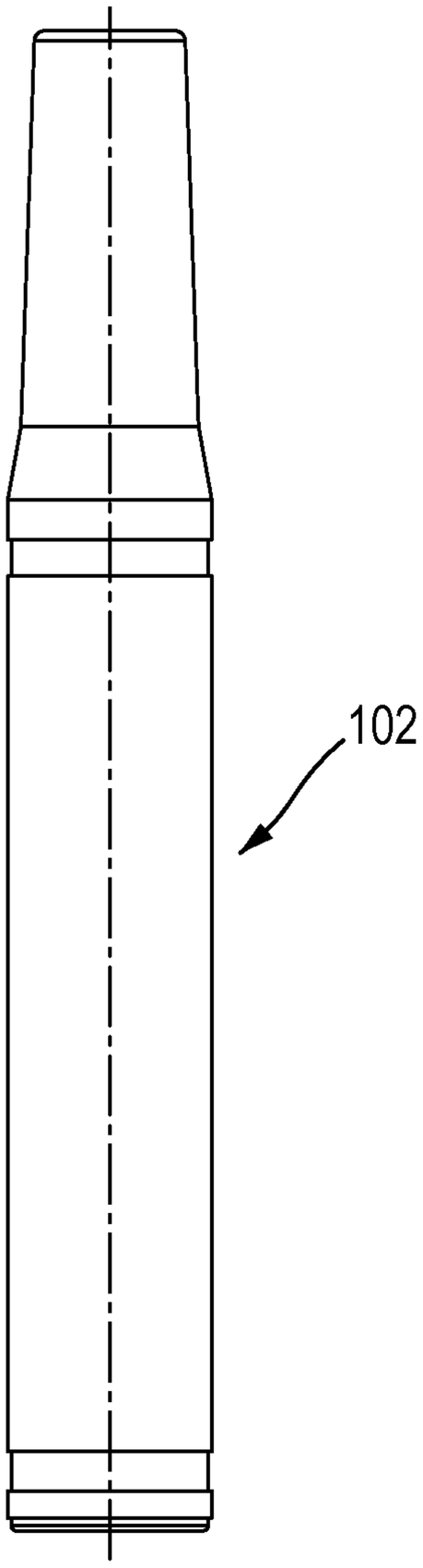


FIG.7

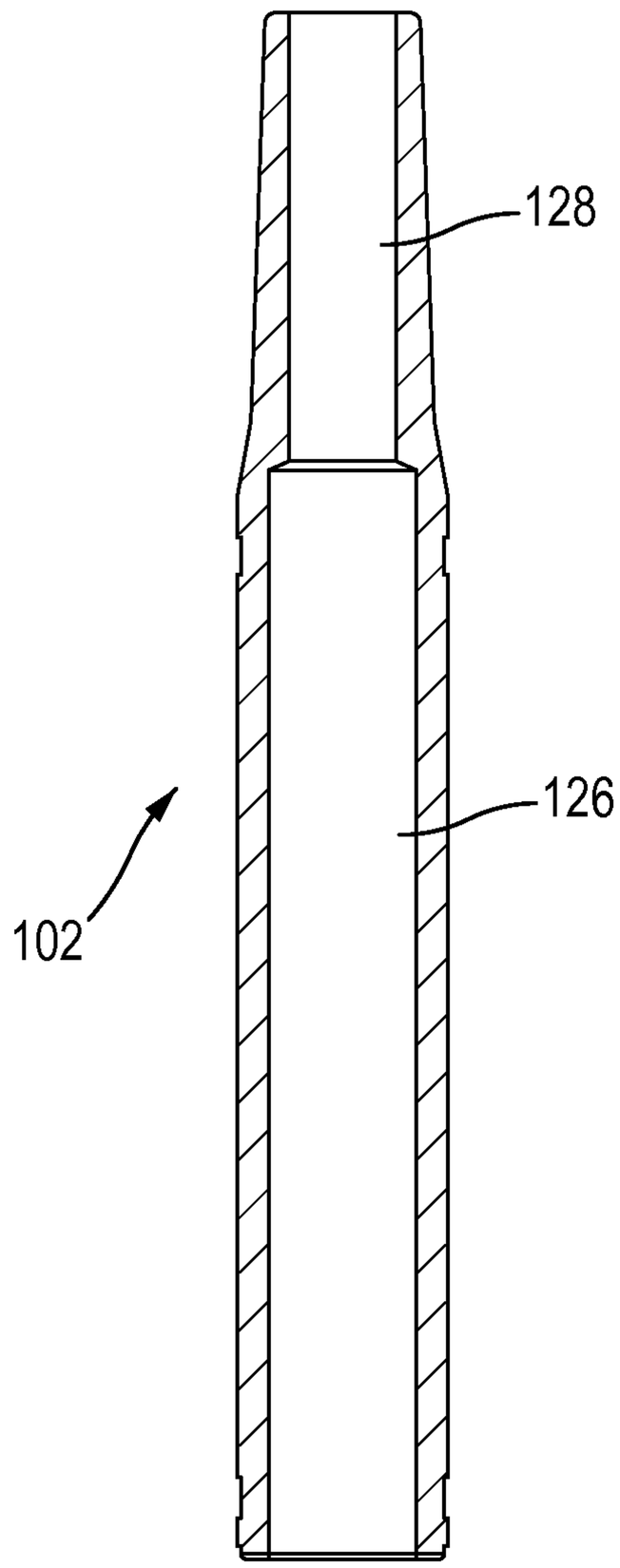


FIG.8

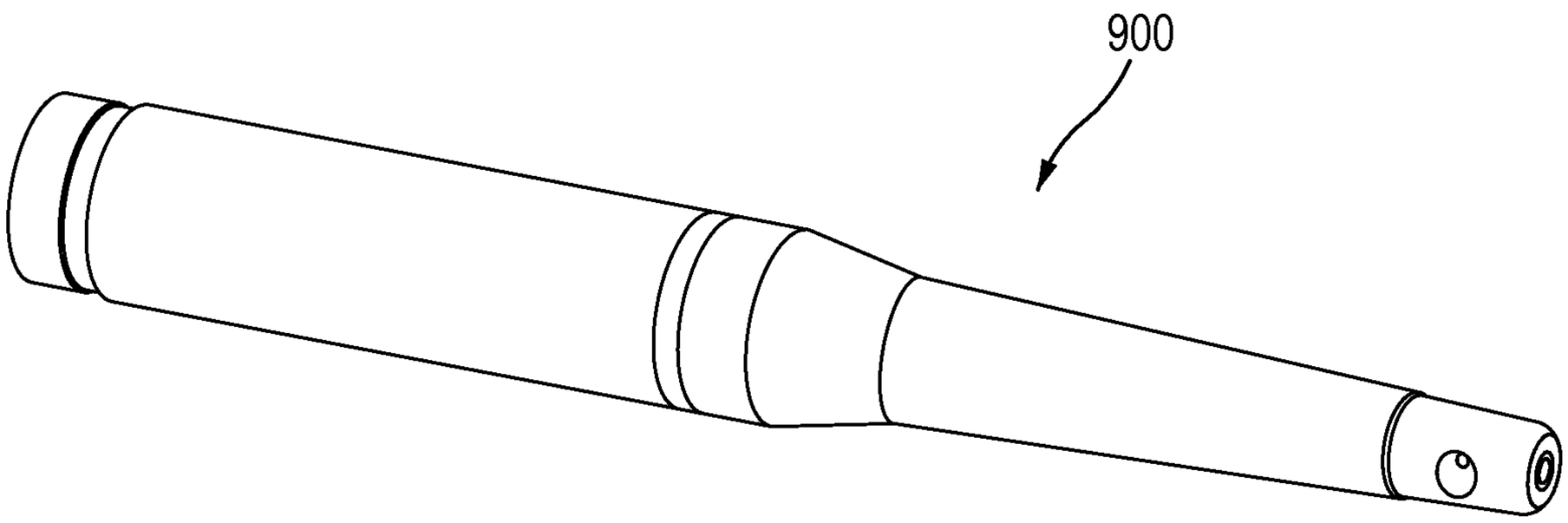


FIG.9

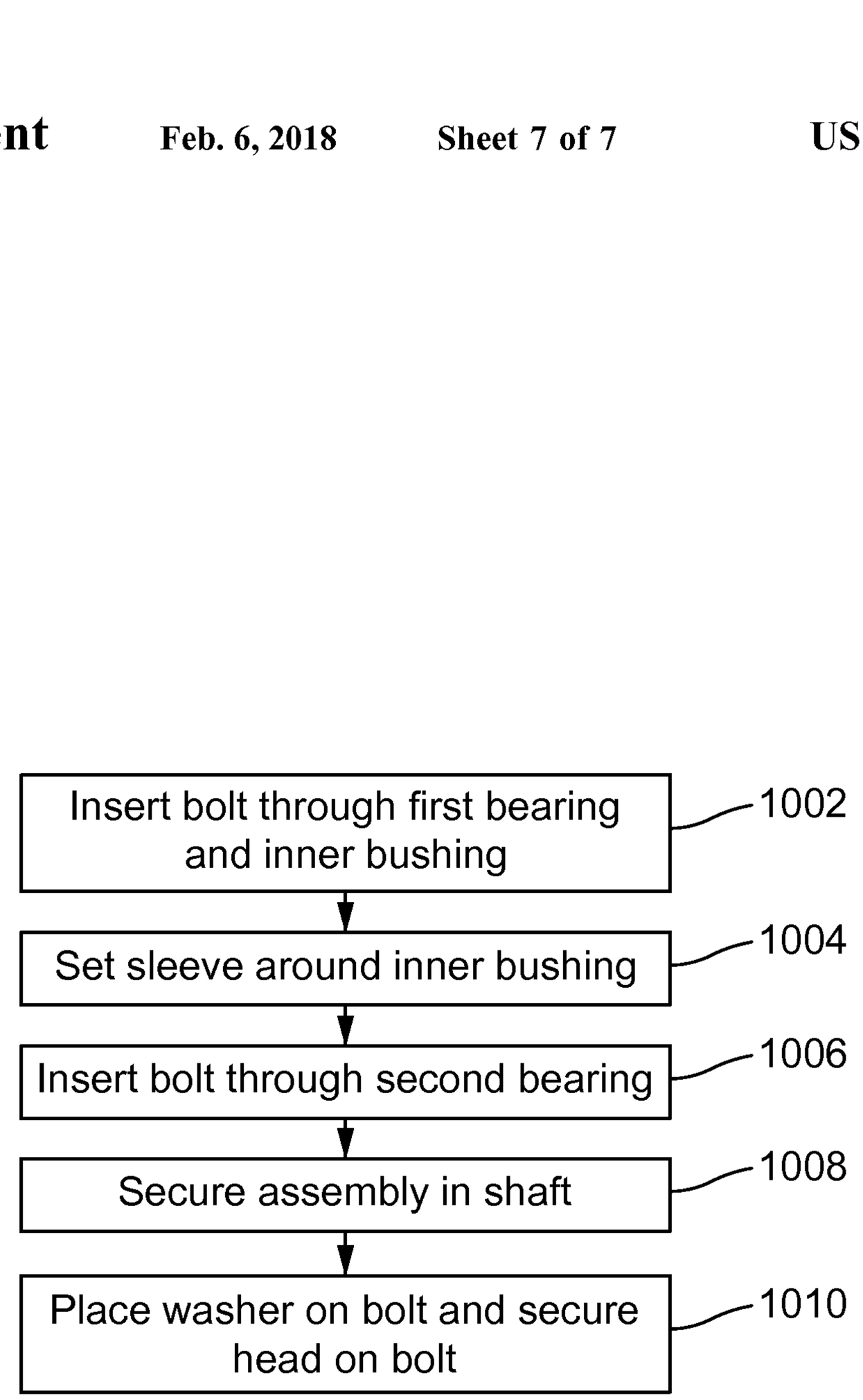

Insert bolt through first bearing and inner bushing
1002
Set sleeve around inner bushing
1004
Insert bolt through second bearing
1006
Secure assembly in shaft
1008
Place washer on bolt and secure head on bolt
1010

FIG.10

JUMP ROPE HANDLE AND METHOD OF ASSEMBLING SAME

BACKGROUND

1. Field

Embodiments of the present invention relate generally to jump ropes. More particularly, embodiments of the present invention relate to an improved jump rope handle and method of assembling the same.

2. Description of the Related Art

Jump ropes have a long history and are widely used for entertainment and exercise. Typically, a jump rope includes a rope attached to two jump rope handles. A user can, while holding the jump rope handles in the user's hands, move the jump rope handles so as to cause the rope to move around the user. Whenever the rope rotates towards the user's feet, the user may jump and the rope may pass under the user's feet.

How a rope attaches to each jump rope handle varies considerably among existing ropes. In some ropes, the rope attaches to a rotating head attached to a grip portion of the jump rope handle. Such a configuration can improve the performance of the jump rope in that the rope may more freely move around the user. However, manufacture and assembly of such jump ropes may be complex. In other ropes, the length of the rope may be adjustable using a collar mechanism allowing the length of the rope to be customized for the user. However, adjustability may be time consuming and difficult.

In light of the foregoing and other shortcomings in the art, it is desirable to provide an improved jump rope handle and method of assembling the same.

BRIEF SUMMARY

It is an aspect of the invention to provide a precision rotating jump rope handle with an improved assembly.

It is a further aspect of the invention to provide flexibility with respect to a length and a type of rope of a jump rope.

According to an aspect of the invention, a jump rope handle is provided. The jump rope handle includes a head. The head includes a channel, a set hole perpendicular to the channel, and a set mechanism adjustably insertable into the set hole. The jump rope handle further includes a grip. The grip includes a cylindrical member, first and second bearings arranged along the cylindrical member, an inner bushing arranged along the cylindrical member between the first and second bearings, and a sleeve around said inner bushing, said bushing being fixedly attached to an inner surface of the grip. An end portion of the cylindrical member is fixedly attached to the head whereby the cylindrical member and the head rotate together about a same axis. The channel of the head is configured to receive a rope. The set mechanism is configured to be inserted into the set hole to secure the rope.

According to another aspect of the invention, a jump rope handle is provided. The jump rope handle may include a head. The head may include a bolt hole, a channel perpendicular to the bolt hole, a set screw hole in line with the bolt hole and perpendicular to the channel, and a set screw adjustably screwed into the set screw hole. The jump rope handle includes a grip including a shaft therein. The shaft includes a bolt, first and second bearings arranged along the bolt, an inner bushing arranged along the bolt between the first and second bearings, and a sleeve around said inner bushing, an outer surface of the sleeve being fixedly attached to an inner surface of the shaft of the grip. A threaded end of the bolt is screwed into the bolt hole of the head and attached thereto whereby the bolt and the head rotate together about a same axis. The channel of the head is configured to receive a rope. The set screw is configured to be screwed into the set screw hole to secure the rope.

According to another aspect of the invention, a method of assembling a jump rope handle may be provided. The method includes securing a sleeve inside a shaft of a grip of the jump rope handle. The sleeve is positioned around an inner bushing arranged along a bolt in between first and second bearings. The method further includes connecting the bolt to a head of the jump rope handle. The head includes a set screw hole to receive a set screw.

The foregoing and other aspects will become apparent from the following detailed description when considered in conjunction with the accompanying drawing figures.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a schematic representation of a jump rope handle according to an exemplary embodiment of the invention.

FIG. **2** is a schematic representation of a cutaway of the jump rope handle of FIG. **1**.

FIG. **3** is a schematic representation of a cutaway of a portion of the jump rope handle of FIG. **1**.

FIGS. **4-6** are schematic representations of the head of FIG. **1**.

FIGS. **7** and **8** are schematic representations of the grip of FIG. **1**.

FIG. **9** is a schematic representation of a jump rope handle according to another exemplary embodiment of the invention.

FIG. **10** is a schematic representation of a method of assembling the jump rope handle of FIG. **1**.

DETAILED DESCRIPTION

Reference will now be made in detail to embodiments of the present invention, examples of which are illustrated in the accompanying drawings, wherein like reference numerals refer to the like elements throughout. The embodiments are described below to explain the present invention by referring to the figures.

As used in the description of this application, the terms "a", "an" and "the" may refer to one or more than one of an element (e.g., item or act). Similarly, a particular quantity of an element may be described or shown while the actual quantity of the element may differ. The terms "and" and "or" may be used in the conjunctive or disjunctive sense and will generally be understood to be equivalent to "and/or". Elements from an embodiment may be combined with elements of another. No element used in the description of this application should be construed as critical or essential to the invention unless explicitly described as such. Further, when an element is described as "connected," "coupled," or otherwise linked to another element, it may be directly linked to the other element, or intervening elements may be present.

According to exemplary embodiments of the invention, an improved jump rope handle and method of assembling the same are provided. In an embodiment, a jump rope handle may include a grip and a rotating head. The grip may include an assembly including a sleeve around a bushing through which a bolt may pass. Bearings may be arranged on the bolt on either side of the bushing and sleeve. The assembly may be secured inside the grip by virtue of the sleeve being fixedly attached to the inside of the grip. An end

of the bolt may be attached to the head. The bolt may rotate within the bearings and the bushing enabling the head to rotate. Accordingly, an embodiment may provide a precision rotating jump rope handle with an improved assembly. Additionally, the head of the jump rope may include a bolt hole to receive the bolt, a channel perpendicular to the bolt hole, and a set screw hole in line with the bolt hole. A set screw may be screwed into the set screw hole to secure a rope within the channel. Accordingly, an embodiment may provide flexibility with respect to a length and a type of a rope of a jump rope.

FIG. **1** is a schematic representation of a jump rope handle **100** according to an exemplary embodiment of the invention. The jump rope handle **100** may include a grip **102** and a head **104**, both arranged along axis A when assembled. The head **104** may rotate around axis A during use. The grip **102** and the head **104** may be formed of aluminum. In an alternative embodiment, the grip or the head may be formed of any suitable material, such as injection molded plastic. Although the jump rope handle is shown having a particular shape, the jump rope handle may have an alternative configuration such as that shown in the exemplary embodiment of FIG. **9**.

FIG. **2** is a schematic representation of a cutaway of the jump rope handle **100** of FIG. **1**. FIG. **3** is a schematic representation of a cutaway of a portion of the jump rope handle **100** of FIG. **1**. The inside of the grip **102** may define a shaft that is hollow that may house a bolt **106**, first and second bearings **108**, **110**, a inner bushing **112**, and a sleeve **114**. The bolt **106** may be formed of alloy steel. In an alternative embodiment, the bolt may be formed of any suitable material such as stainless steel. The first and second bearings **108**, **110** may be formed of steel. In an alternative embodiment, the bolt may be formed of any suitable material such as stainless steel. The inner bushing **112** may be cylindrical and may be formed of brass. In an alternative embodiment, the inner bushing may be formed of any suitable material such as steel. The sleeve **114** may be cylindrical and may be formed of steel. In an alternative embodiment, the sleeve **114** may be formed of any suitable material.

The bolt **106** may be surrounded by the first and second bearings **108**, **110** and the inner bushing **112**. The inner bushing **112** may be located between the first and second bearings **108**, **110**. The sleeve **114** may be located around the inner bushing **112**. An outer diameter of the sleeve **114** may be slightly larger than an inner diameter of the shaft of the grip **102** and may thereby provide an interference fit securing the bolt **106**, the first and second bearings **108**, **110**, and the inner bushing **112** within the grip **102**. A suitable adhesive material such as thread-lock glue may be added to an outer surface of the sleeve **114** and an inner surface of the grip **112**. In operation, the sleeve **114** may remain stationary and not rotate due to the interference fit and the adhesive material. In an alternative embodiment such as one featuring an injection molded plastic grip, the sleeve may be formed integral with the grip. In a further alternative embodiment, the sleeve may be affixed to the grip using an interference fit. In a further alternative embodiment, an outer diameter of the sleeve may match or be slightly smaller than an inner diameter of the shaft of the grip and adhesive material may be used to affix the sleeve to the shaft of the grip.

FIGS. **4-6** are schematic representations of the head **104** of FIG. **1**. The head **104** may include a bolt hole **116**, a channel **118**, a set screw hole **120**, and a set screw **122**. The set screw **112** may be formed of alloy steel. In an alternative embodiment, the set screw may be formed of any suitable material such as stainless steel.

When assembled with the grip **102**, the bolt hole **116** and the set screw hole **120** may each be in line with the handle axis A while the channel **118** may be perpendicular to the handle axis A. The head **104** may rotate about axis A during use while the channel **118** may remain perpendicular to the handle axis A during rotation of the head.

FIGS. **7** and **8** are schematic representations of the grip **102** of FIG. **1**. The shaft of the grip **102** may include first and second portions **126**, **128**. The first portion **126** of the shaft may be larger in diameter than the second portion **128** of the shaft.

Referring now to FIGS. **3** and **5**, the bolt hole **116** of the head **104** may receive an end of the bolt **106**. The bolt **106** may be tightened thereby putting tension on the head **104**. By tightening the bolt **106**, the head **104** may thereby be pulled towards the grip **102** thereby sandwiching the first and second bearings **108**, **110** and the inner bushing **112**. A shim-washer **130** may be placed between the second bearing **110** and the head **104**.

In more detail, the inner bushing **112** may be located between the first and second bearings **108**, **110**. The inner bushing **112** may be longer than the sleeve **114**. The ends of the inner bushing **112** may contact only inner races of the first and second bearings **108**, **110** and may prevent the first and second bearings from being over-tightened. When being assembled, the bolt **106** may be tightened until there is no play in the first and second bearings **108**, **110** and not further so as to not reduce functionality of the first and second bearings **108**, **110**. A suitable adhesive material such as a thread-lock glue may be used to form a bond between threads of the bolt **106** and threads of the bolt hole **116** once the bolt **106** has been appropriately tightened.

An assembly of the bolt **106**, the first and second bearings **108**, **110**, and the inner bushing **112** may be contained within the second portion **128** of the shaft of the grip **102** by the sleeve **114** and its attachment to the grip through the interference fit and adhesive or other attachment as already described. When assembled, a compression load may be held by the inner races of the first and second bearings **108**, **110** and the inner bushing **112** by the bolt **106** to the head **104**. Ends of the sleeve **114** may contact the outer races of the first and second bearings **108**, **110**. According to this construction, the first and second bearings **108**, **110** may be isolated from the handle **102** and may spin freely during operation and not be bound.

Referring to FIG. **5**, the set screw hole **120** may extend from an end of the head **104** through to the channel **118**. The set screw **122** may be screwed into the set screw hole **120**. A tip of the set screw **122** may insert into the channel **118** when the set screw **122** is screwed into the screw hole **120** thereby pressing against an end of a jump rope (not shown). Because the set screw **122** may be removable, a length of the jump rope may be adjustable for a user.

It should be noted that the jump rope handle **100** may be compatible with a variety of different jump rope shapes and materials. For example, a jump rope may be formed of a traditional rope, a metal chain, a beaded chain, a metal wire, or any other suitable material.

The set screw **122** may include an extended point **124** (or "dog point") that may clamp down on the jump rope. In an alternative embodiment, the set screw may include any suitable shape, such as a cone point, a round point, or a cup point, such as may be desirable based on the material of the jump rope.

FIG. **10** is a schematic representation of an exemplary method of assembling the jump rope handle **100** of FIG. **1**. In one or a set of operations, the sleeve **114** may be secured inside of the shaft of the grip **102** of the rope handle. For example, in operation **1002**, the bolt **106** may be inserted

through the first bearing **108** and the inner bushing **112**. In operation **1004**, the sleeve **114** may be placed around the inner bushing **112**. In operation **1006**, the bolt **106** may be inserted through the second bearing **110**, thereby completing the assembly of the bolt **106**, first and second bearings **108**, **112**, the inner bushing **112**, and the sleeve **114**.

In operation **1008**, the assembly of the bolt **106**, first and second bearings **108**, **110**, the inner bushing **112**, and the sleeve **114** may be inserted into the second portion **128** of the shaft of the grip **102**. A suitable adhesive material may first be applied to the outer surface of the sleeve **114** and the inner surface of the second portion **128** of the shaft of the grip **112**. The assembly of the bolt **106**, first and second bearings **108**, **110**, the inner bushing **112**, and the sleeve **114** may be secured in position by press-fitting the assembly of the bolt **106**, first and second bearings **108**, **110**, the inner bushing **112**, and the sleeve **114** into second portion **128** of the shaft of the grip **102**, and by the adhesive. In an alternative embodiment including a sleeve having a matching or smaller diameter than the second portion **128** of the shaft, the assembly (bolt **106**, first and second bearings **108**, **110**, inner bushing **112**, and sleeve **114**) may be secured in the second portion using an adhesive. The adhesive may cure thereby securing the sleeve **114** to the second portion of the shaft.

In another operation or set of operations, the bolt **106** may be connected to the head **104** of the jump rope handle **100**. For example, in operation **1010**, the shim-washer **130** may be placed on the bolt **106**, and the head **104** may be connected to (i.e., screwed onto) the bolt **106**. The bolt **106** may be tightened into the bolt hole **116** thereby pulling the head **104** towards the grip **102** thereby sandwiching the first and second bearings **108**, **110** and the inner bushing **112**. Adhesive may be used to secure the bolt in the bolt hole **116**.

According to embodiments of the invention, a precision rotating jump rope handle may be provided with an improved assembly. The manufacture and the assembly of the jump rope handle may be desirable. Further according to the embodiments, flexibility with respect to a length and a type of a rope of a jump rope may be provided. The length may be customized to a user. The type of rope used with the jump rope handle may vary.

Although embodiments of the present invention have been shown and described, it would be appreciated by those skilled in the art that changes may be made in these embodiments without departing from the principles and spirit of the invention, the scope of which is defined in the claims and their equivalents. For example, operations of the method for assembling a jump rope handle may be performed in a different order. For example, an inner bushing may first be inserted into the sleeve **114** and then the bolt **106** may be inserted through the first bearing **108** and the inner bushing **112** having the sleeve **114** thereon. As a further alternative, during the assembly of the jump rope handle **100**, the sleeve **114** may first be inserted into the second portion **128** of the shaft of the handle and fixed in position with adhesive. Thereafter, the bolt **106** and first bearing **108** may be inserted through the first portion **126** of the shaft into the second portion **128** and the inner bushing **112** and second bearing **110** could be inserted into the second portion **128** of the shaft. These and other changes are considered to be within the scope of the invention.

What is claimed is:

1. A jump rope handle, comprising:

a head, including:

a channel;

a set hole perpendicular to the channel; and

a set mechanism adjustably insertable into the set hole;

a grip, including:

a cylindrical member axially spaced apart from an inner surface of the grip;

first and second bearings arranged along the cylindrical member, the bearings having an inner race and an outer race, with the inner races extending about the cylindrical member and with the outer races axially spaced apart therefrom;

an inner bushing extending around the cylindrical member between the inner race of each of the first and second bearings and spaced apart from the inner surface of the grip with the inner bushing being independently movable relative to the inner surface of the grip; and

a sleeve extending around said inner bushing, said sleeve having an outer diameter originally larger than a diameter of the inner surface of the grip, said sleeve being fixedly attached to the inner surface of the grip by a compression fit resulting from press-fitting the cylindrical member, the first and second bearings, the inner bushing, and the sleeve into the grip, and the sleeve being interfaceable with the outer race of each of the first and second bearings,

wherein an end portion of the cylindrical member is fixedly attached to the head whereby the cylindrical member and the head rotate together about a same axis,

wherein the channel of the head is configured to receive a rope, and

wherein the set mechanism is configured to be inserted into the set hole to secure the rope.

2. The jump rope handle of claim **1**, wherein the sleeve is fixedly attached to the inner surface of the grip by adhesive.

3. The jump rope handle of claim **1**, wherein the end portion of the cylindrical member is fixedly attached to the head by adhesive.

4. The jump rope handle of claim **1** wherein the sleeve has an upper end and a lower end, and the inner bushing has an upper end and a lower end, the upper end of the sleeve and the upper end of the inner bushing align with each other, with the lower end of the sleeve being spaced apart from the lower end of the inner bushing.

5. A jump rope handle, comprising:

a head, including:

a bolt hole;

a channel perpendicular to the bolt hole;

a set screw hole in line with the bole hole and perpendicular to the channel; and

a set screw adjustably screwed into the set screw hole;

a grip including a shaft therein axially spaced apart from an inner surface of the grip, the shaft including:

a bolt;

first and second bearings arranged along the bold, the bearings having an inner race and an outer race, with the inner races extending about the bolt and the outer races being axially spaced apart therefrom;

an inner busing extending around the bolt between the inner race of each of the first and second bearings and spaced apart from the inner surface of the grip; and

a sleeve extending around said inner bushing, said sleeve having an outer diameter originally larger than a diameter of the inner surface of the shaft of the grip, an outer surface of the sleeve being fixedly attached to the inner surface of the shaft of the grip by a compression fit resulting from press-fitting the bolt, the first and second bearings, the inner bushing, and the sleeve into the shaft of the grip, and the

sleeve being interfaceable with the outer race of each of the first and second bearings with the inner bushing being independently movable relative to the inner surface of the grip,

wherein a threaded end of the bolt is screwed into the bolt hold of the head and attached thereto whereby the bolt and the head rotate together about a same axis,

wherein the channel of the head is configured to receive a rope, and

wherein the set screw is configured to be screwed into the set screw hole to secure the rope.

6. The jump rope handle of claim **5**, wherein the sleeve is fixedly attached to the inner surface of the shaft of the grip by adhesive.

7. The jump rope handle of claim **5**, wherein the threaded end of the bolt is fixedly attached to the bolt hole of the head by adhesive.

8. The jump rope handle of claim **5** wherein the sleeve has an upper end and a lower end, and the inner bushing has an upper end and a lower end, the upper end of the sleeve and the upper end of the inner bushing align with each other, with the lower end of the sleeve being spaced apart from the lower end of the inner bushing.

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